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Knowledge Level of Community Participant on Dengue Fever Symptoms and Early Treatment in Bandung City

Tingkat Pengetahuan Masyarakat Terhadap Gejala Demam Dengue dan Pengobatan Dini di Kota Bandung

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ABSTRAK
Di negara tropis, gejala demam dengue sangat mirip dengan gejala infeksi tropis umum lainnya. Tidak ada terapi khusus untuk infeksi dengue, kunci keberhasilan manajemen infeksi dengue ialah perawatan suportif yang tepat waktu dan bijaksana. Pengetahuan masyarakat mengenai demam dengue dan penanganan pertama demam di rumah, terutama untuk anak-anak, sangat penting guna mengurangi beban infeksi demam dengue. Studi tentang pengetahuan masyarakat mengenai demam dengue masih sangat terbatas. Penelitian ini bertujuan untuk mengukur pengetahuan masyarakat Kota Bandung mengenai gejala demam dengue dan menentukan prediktor utama dalam mendapatkan skor pengetahuan dengue yang tinggi di Kota Bandung. Pengumpulan data dilakukan dengan wawancara pada responden dari tiap-tiap rumah tangga. Analisis multivariat dengan regresi logistik digunakan untuk menentukan odds-ratio faktor-faktor demografis yang mencapai indeks tinggi. Sebagian besar responden (lebih dari 70%) memiliki tingkat pengetahuan menengah sampai tinggi mengenai gejala demam dengue dan pertolongan pertama. Hasil penelitian menunjukkan terdapat korelasi antara tingkat pengetahuan dengan skor tinggi wanita, tingkat pendidikan sarjana, dan pengusaha.

***Kata kunci**: komunitas, demam dengue, pengetahuan, tata laksana*

ABSTRACT
In tropical countries, dengue fever is often confused with other common tropical infections. There are no specific therapeutic treatment for dengue infections, and the key of successful dengue case management are a timely and judicious supportive care. Community knowledge about dengue fever and treatment at home, particularly for children is crucial to reduce the burden of dengue infection. Unfortunately, studies on community's knowledge of dengue fever are still very limited. The aims of this study are to measure people's knowledge about dengue fever and to determine the main predictors of a high index on dengue knowledge, in Bandung City. Data collection was carried out by interviewing respondents from each household. Multivariate analysis with logistic regression was used to determine the odds-ratio demographic factors that reached a high index. Study participants generally showed medium-to-high level of knowledge regarding Dengue fever symptoms and its first aid. This group accounts for more than 70% of all respondents This study also showed that the likeliness of having high-score of knowledge was correlated with being a female, having at least an undergraduate level of education, and being an entrepreneur.

Keywords: community, dengue fever, knowledge, treatment

INTRODUCTION

Dengue is an acute viral illness caused by RNA virus of the family Flaviviridae and spread by Aedes mosquitoes.[1] The infection is usually self-limiting and comes with diverse clinical presentations that ranges from asymptomatic illness to dengue fever (DF) to the severe illness of dengue hemorrhagic fever/dengue shock syndrome.[2] Acute-onset high fever, muscle and joint pain, myalgia, cutaneous rash, hemorrhagic episodes, and

circulatory shock are the commonly seen symptoms.[1]

Dengue fever follows both primary and secondary infections that is most frequently encountered in adults and older children. Onset of symptoms are characterized by a biphasic and high-grade fever lasting for 3 days to 1 week.[3,4] The fever is also known as break bone fever because of the associated myalgia and pain in joints.[5,6] In tropical countries, including Indonesia, dengue fever is often confused with other common tropical infections like enteric fever, leptospirosis, typhus fever, malaria, etc. Many of these illnesses turn up in significant numbers after rains, showing similar early presentations that cause confusion in decision-making.[7, 8] There are no therapeutic agents for dengue infections to date, so the key to the successful management is a timely and judicious use of supportive care.

Bandung city, the capital of West Java Province had the highest DHF cases with 3,822; 5,057; 5,127 and 3,132 cases in 2011, 2012, 2013, and 2014 respectively.[9] The majority of residents who were infected range from 2-14 years old or at school age.[10]

Recognizing the signs of progression to the severe form of the disease during the initial febrile phase which lasts between two and seven days may be difficult, especially in children, as the symptoms are often indistinguishable from other acute febrile diseases.[11] Fever is a very common complaint in children and is the single most common non-trauma-related reason for a visit to the emergency department. Severity usually becomes apparent in the critical phase, when a sudden drop of body temperature associates with clinical and laboratory manifestations of endothelial dysfunction, i.e. increased capillary permeability and plasma leakage, indicating a clinical alert.[12] Therefore, cautiousness is crucial for understanding the journey of dengue virus infection.[13]

Previous studies have emphasized the importance of early detection of dengue through clinical and laboratory diagnoses, however, public's awareness on dengue fever is far more important.[14] Some studies show that fever patients are generally only advised to rest at home. Parents are concerned about fever and it's potential complications.[11] A research conducted by Rasinta showed there was a positive relationship between the level of knowledge of mothers about fever with mother's behavior in handling toddlers with fever.[15]

Public knowledge about dengue fever and fever handling at home, especially for children, are very important in reducing the burden of dengue infection. Unfortunately, the evaluation on the effectiveness of home-care fever management is still very lacking, as well as the study on people's knowledge of dengue fever. Therefore, this study intended to measure people's knowledge about dengue fever and to determine the main predictors of having a high index on dengue knowledge in Bandung City.

METHODS

Sampling Locations

This is a cross-sectional survey in communities at 16 villages in Bandung City. The sixteen villages were: Cigondewa, Cibaduyut, Sukaasih, Sukabungah, Lebak Siliwlangi, Pasteur, Cipedes, Ciateul, Tamansari, Sukapada, Nyengseret, Antapani, Cikutra, Cijawura, and Cigadung. Those villages were chosen based on 4 parameters: dengue incidence, population density, altitude and socio-economic condition with stratified random sampling.

Sampling Method

Sampling units (households) were allocated proportionally to the size method. The sample size was determined by non-probability sampling (quota sampling), calculated following the equation from Lemeshow *et al*.[16]

$$n = \frac{Z^2 p\,(1-p)}{E^2}$$

Where:
n = The sample size
E = Acceptance error 10 %
Z = 1.96 (the standard normal score at the 95% confidence interval)
P = 0.50 (P value of prevalent knowledge regarding dengue fever is taken as 50%).[17]

The sample size was then increased by 20% to allow for limited number of missing or incomplete data that could occurred during data collection.[18] Consequently, requirement of the sample size was at least 115 households, with the minimum of 7 houses for each village. Each household was represented by a father, mother or adult woman who oversaw the daily house chores.

Instrument

Validated questionnaires, consisted of 14 questions, were divided into 2 parts: the socio-demographic characteristics (age, gender, education, occupation) and knowledge (10 questions), with the reliability test of 0.76.

Ethics

This study was approved by the ethics committee of Universitas Padjajaran with the ethical clearance registration number 071711.

Data collection

Before collecting the data, the three research assistants were standardized for the protocol. Data collection by face-to-face interview of one respondent required at least 10 minutes for a complete filling of the questionnaires. Permission of data collection was obtained from Bandung City Government and Bandung Health Institution under the Dengue Project. Inform Consent of the participants was taken after study's purpose explanation and participant's verbal expression showing their willingness on information sharing. All data were recorded in a Microsoft Excel 2007 sheet for further analysis.

Data analysis

The responses obtained from the field survey were documented into the binary array (1-0), followed by scoring of the participants as the total amount of the 'yes' answers. Participants who have scored below and/or equal to first quartile, between first and third quartile, and equal and above third quartile were then classified as the low, middle, and high-scoring participants on symptoms and early fever treatment knowledge, respectively. Each of the questions in the survey was checked of their 95% confidence interval, along with its margin of error (displayed on tables). Socio-demographic factors (age, sex, education, occupation) were assessed for its effect to the odds of having high index through a multinomial logistic regression, performed on R Studio with the result being rounded to two decimal places. In this case, socio-demographic factors played a role as independent variable, while knowledge score (low, medium, high) was used as dependent variable.

RESULTS

Demography

In this study, we collected 210 respondents which represent 210 household across Bandung City, Indonesia. From these study participants, 63.3% were identified as female, and 36.7% as male. Ages ranged from the 20 years old (the youngest) to 72 years old (the oldest). The largest portion of participants (41.9%) have attended at least undergraduate level, just above the portion of participants who have attended tertiary education (28.1%). Nevertheless, only 3.3% of the respondents attended secondary level of education (middle school/*Sekolah Menengah Pertama)*. Housewives and unemployed persons dominated the share of occupation with 49.1% of them, with only 3.3% of the study participants identify as health workers (Table 1).

Figure 1 shows that the largest portion of participants had medium score on knowledge of dengue fever. Further analysis was done by

looking at the demographic factors to determine factor which could become good indicator of high score in knowledge, using the multivariate logistic regression to calculate the odds ratio (OR). As previously shown in Table 1, the significantly highest OR values were found for three demographic factors: being female, education level at undergraduate or above, or being entrepreneur. This suggested that the three factors could be good indicators for assuming a society's score for knowledge on dengue.

Table 1. The Demographic Information of Participants in This Survey, and Its Odds Ratio for Level of Knowledge on Dengue from 16 Villages in Bandung City in 2018

Characteristics	% (n=210)	Odds ratio (95% CI)
Sex		
Male	36.7 (77)	-
Female	63.3 (133)	5.55
Age		1.09
20-34	26.7 (56)	-
35-49	43.3 (91)	-
50-64	23.3 (49)	-
65-79	6.7 (14)	-
Education		
Primary	10 (21)	0.005
Secondary (Middle school)	3.3 (7)	0.01
Tertiary (High school)	28.1 (59)	0.05
Vocational high school	10 (21)	0.03
Diploma	6.7 (14)	-
Undergraduate	41.9 (88)	0.12
Occupation		
Unemployed/housewives	49.1 (103)	0.12
Health workers	3.3 (7)	-
Employee	25.7 (54)	0.23
Entrepreneur	8.1 (17)	3.73
Teacher	8.1 (17)	-
Retired	5.7 (12)	0.27

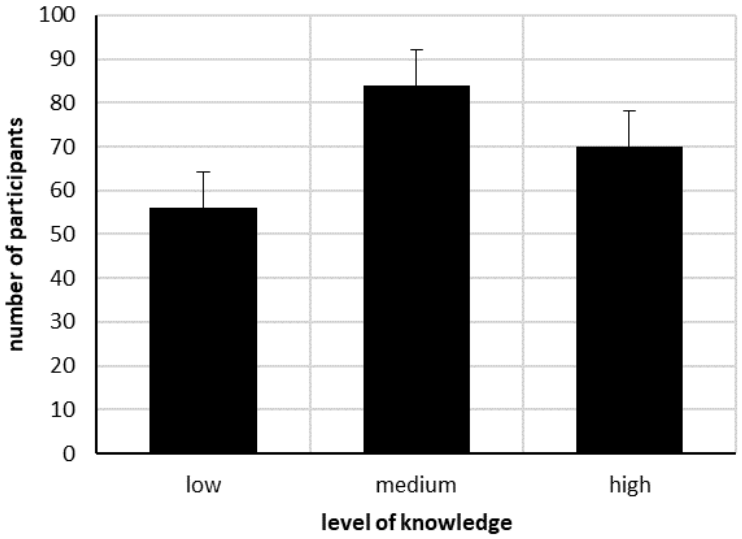

Figure 1. Distribution of Knowledge Level Regarding Dengue Symptoms and General First Aid

The low, medium, high indicator are designated as participants having scored less and equal than 1st quartile, between first and third quartile, and equal and higher than third quartile, respectively.

Table 2. Knowledge of Dengue First Aid and Symptoms

Indicators	n (n=210)	% (95% CI)
First aid		
Know how to do first aid	196	93.3 (89.9 – 96.7)
Know that people with fever should be given tepid sponging	182	86.7 (82.1 – 91.2)
Know that fever sufferers should wear loose clothes	161	76.7 (70.9 – 82.3)
Know when fever sufferers should be taken to a doctor	140	66.7 (60.3 – 73)
Know the dose of antipyretic	105	50 (43.2 – 56.8)
Know that fever sufferers should be in a cool room	98	46.7 (39.9 – 53.4)
Know that fever sufferers should drink a lot	98	46.7 (39.9 – 53.4)
Dengue Symptoms		
Know that one of the signs of dengue infection is 2-7 days of fever	203	96.7 (94.2 – 99.1)
Know another symptom of dengue infection	147	70 (63.8 – 76.2)
Know that people with dengue fever complains heartburn	133	63.3 (56.8 – 69.9)

Knowledge Regarding Dengue Fever

We included ten binary yes-no questions in the questionnaire as presented in Table 2. Yet, there was no single question that was answered 'no' below 45% of the respondents. The highest-scoring questions comprised of two questions, one of each was from First Aid and Symptoms category, which covered *'Know how to do first aid'*, and '*know one of the signs of dengue infection is 2-7 days of fever*'. Both questions were answered positively by more than 90% of the respondents, 93.3% and 96.7% respectively. Nevertheless, there were two questions below 50% of positive answers: '*know that fever sufferers should be in a cool room'* and *'know that fever sufferers should drink a lot', suggesting the lack of this crucial knowledge should be emphasized and become the first entry in future public health education on dengue. This is important, considering that there could be a plasma leakage in dengue patients, especially for children*. From these results, we can categorize them into three groups. High-scoring participants, medium-scoring participants, and low scoring-participants.

DISCUSSIONS

This study was carried out to measure public knowledge about dengue fever and to determine the main predictors of a high index on dengue knowledge, in Bandung City. Public knowledge about Dengue fever is very important to reduce the burden of Dengue infection. Unfortunately, the evaluation or the report on this matter is still limited, especially for the people in Bandung. Yet in short, this study has demonstrated that most of the people who participated in this study have medium-to high level of knowledge indicator about Dengue fever symptoms and its first aid, albeit almost half of the participants were graduated from high school or above.

The high level of knowledge from study participants is also observed from previous studies carried out in rural Cambodia.[18] Comparing it to this study by the demographic factors, this study shared similar characteristics such as larger proportion of female participants. Other similarity was also demonstrated by the highest odds ratio of female group, indicating that being female is the main predictor of having higher knowledge regarding Dengue. It is worth noting that the high score on the knowledge reflects the common social role of women in Indonesia as a caretaker.

Our results also demonstrated that longer duration of attending formal education correlated with higher odds of obtaining high score in Dengue knowledge, emphasizing the importance of formal education level as a good indicator. This picture was also found in previous studies elsewhere, showing that educational attainment positively correlates with the knowledge on Dengue.[18]

The last predictor discovered in this study for high level of knowledge was interestingly by being an entrepreneur. This is a unique finding, since health workers surprisingly did not obtain the high level of Dengue knowledge. Bearing in mind that this could be a limitation of this study, where random selection of the participants still picked large portion of entrepreneur with high level of the knowledge, while also recruited those health workers with surprisingly low-knowledge.

CONCLUSIONS

In conclusions, study participants in Bandung generally showed medium-to-high level of knowledge regarding Dengue fever symptoms and its first aid. This group accounts for more than 70% of all respondents. The main predictor for a high level of knowledge is by being female, having at least attended undergraduate level of education, and being an entrepreneur.

RECOMMENDATION

With this overall level of knowledge, it is difficult to achieve the goal of a more effective education on dengue just by pushing more of the same educational campaigns. Instead, a Communication for Behavioral Impact (COMBI) method is preferable to make sure that the attained knowledge will be translated into practice. Government and all who concerned should be proactive, to seek information and insights in a planned, systematic process, informed by evidence, effective models and good practice.

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